Assignment 2

Textbook Assignment: "Hydraulic Fluids," chapter 3, pages 3-6 through 3-11; "Pumps," chapter 4; and "Fluid Lines and Fittings," chapter 5, pages 5-1 through 5-11.

Learning Objective: Identify types, characteristic, origin, control, and checks for various hydraulic system contaminants.

2-1. Trouble develops in a hydraulic system when the fluid becomes contaminated as the result of

1. system component deterioration
2. friction at hotspots
3. abrasive wear
4. any action that places foreign matter in the fluid

2-2. By which of the following ways may air enter into a hydraulic system?

1. Through improper maintenance
2. Past leaky seals in gas-pressurized accumulators
3. Past actuator piston rod seals
4. Each of the above

2-3. Water contamination of a hydraulic system is NOT a major concern since its presence aids in reducing the flammability of the fluid.

1. True
2. False

2-4. Chemical contamination of hydraulic liquid by oxidation is indicated when the liquid contains which of the following materials?

1. Sludge
2. Asphaitine particles
3. Organic acids
4. Each cf the above

2-5. Compatibility of hydraulic liquid with the seals and hoses in a system prevents which of the following problems from occurring?

1. Gum formation around the seals and within the hoses
2. Deposits of contaminants on the seals and within the hoses
3. Condensation of moisture within the system
4. Chemical reaction between the liquid acid the seal or hose material and consequent breakdown of these parts

2-6. All of the following contaminants are abrasive EXCEPT

1. lint
2. rust
3. sludge
4. sand particles

2-7. Whenever drained or used hydraulic fluid is returned to a system, straining is necessary only if the cleanliness of the storage container is questionable.

1. True
2. False

2-8. Which of the following agents should parts of a hydraulic component be cleaned with prior to being assembled?

1. An approved dry-cleaning solvent
2. Trichlorotrifluoroethane
3. Chlorinated solvents
4. Trichlorofluoromethane

2-9. Which of the following agents, if combined with minute amounts of water found in operating hydraulic systems, does NOT change into hydrochloric acid?

1. An approved dry-cleaning solvent
2. Trichlorotrifluoroethane
3. Chlorinated solvents
4. Trichlorofluoromethane

2-10. When you analyze operating hydraulic fluids, changes in which of the following areas may be of particular interest to you?

1. Chemical properties
2. physical properties
3. particulate contamination
4. Any of the above

2-11. From which of the following locations can fluid samples be taken?

1. Filter bowls
2. Tops of tanks
3. Pipe drains after sufficient fluid has drained
4. Each of the above

Learning Objective: Indicate functions, operating characteristics, and related data pertinent to hydraulic pumps.

2-12. Which of the following is the function of a hydraulic pump?

1. To provide flow to the hydraulic system
2. To create the pressure required in a hydraulic system
3. To control the pressure required in a hydraulic system
4. To compensate for atmospheric pressure at varying altitudes

2-13. If a hydraulic pump is located below the reservoir, fluid is supplied to its inlet port by which of the following forces?

1. Fluid head
2. Gravity
3. Atmospheric pressure
4. A combination of all of the above

2-14. The ratings of most hydraulic pumps are determined by their

1. efficiency
2. output per unit time
3. volumetric output at a given pressure
4. amount of internal slippage

2-15. Pump performance can be expressed in which of the following terms?

1. Gallons per minute
2. Cubic inches per revolution
3. Both 1 and 2 above
4. Cubic feet per minute

2-16. In contrast to a nonpositive-displacement pump that can operate with its discharge outlet completely restricted, a positive-displacement pump cannot do so and must be used with a pressure regulator.

1. True
2. False

Learning Objective: Identify operating principles and construction features of rotary pumps

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2-17. Slippage is the term given to the amount of fluid that can return from the discharge side to the suction side of a rotary pump through the space or clearances between the stationary and moving parts.

1. True
2. False

2-18. Which of the following is generally the basis for rotary pump classification?

1. Type of drive
2. Shaft position
3. Service application
4. Type of rotating element

2-19. What type of gears is illustrated in figure 4-1 of your textbook?

1. Spur
2. Helical
3. Crescent
4. Herringbone

2-20. Which type of gear-type rotary pumps discharges the smoothest fluid flow?

1. Spur
2. Helical
3. Herringbone
4. Crescent

2-21. Why are helical gear pumps classified as external gear pumps?

1. Both sets of teeth project inward toward the center of the gears
2. Both sets of teeth project outward from the center of the gears
3. The teeth of the interior gear project inward toward the center of the gears, and the teeth of the exterior gear project outward from the center of the gears
4. The teeth of the interior gear project outward from the center of the gears, and the teeth of the exterior gear project inward toward the center of the gears

2-22. Refer to figure 4-2, view B, in your textbook, What determines the volume delivery of this pump?

1. The size of the crescent
2. The size of the internal gear
3. The speed of rotation of the crescent
4. The speed of rotation of the drive gear

2-23. Refer to figure 4-7 In your textbook. The vanes of the lobe pump are used for which of the following purposes?

1. To reduce wear of the pump caused by surface to surface contact
2. To provide a good seal between the lobes and the point of lobe junction in the center of the pump
3. To provide a good seal between the lobes and the chamber
4. To do both 2 and 3 above

2-24. The pump illustrated In figure 4.9 of your textbook is designated as unbalanced because the pumping action is done by one side of the shaft and rotor.

1. True
2. False

2-25. Which, if any, of the following statements is true of a screw pump ?

1. Its performance is based on the fluid' s viscosity
2. It is very efficient
3. The idler rotors are connected by gears
4. None of the above

Learning Objective: Recognize functions, principles of operation, and construction features of various types of reciprocating pumps.

REFER TO FIGURE 4-10 IN YOUR,TEXTBOOK IN ANSWERING QUESTIONS 2-26 AND 2-27.

2-26. This type of pump is used in some aircraft hydraulic systems to provide a source of hydraulic power for what purpose(s)?

1. Emergencies
2. Testing certain subsystems during preventive maintenance
3. Determining the causes of malfunctions in certain subsystems
4. All of the above

2-27. Why is liquid discharged through the outlet port when the piston is moved to the right?

1. The piston rod makes the inlet chamber smaller than the outlet chamber
2. Check valve B opens, admitting liquid to the inlet port and outlet port through check valve A
3. Check valve A opens, causing the liquid confined in the inlet chamber to flow to the smaller outlet chamber and out the outlet port
4. Check valve A closes, causing the liquid confined in the inlet chamber to flow to the outlet chamber and out the outlet port

REFER TO FIGURE 4-11 IN YOUR TEXTBOOK IN ANSWERING QUESTIONS 2-28 THROUGH 2-30.

2-28. Which of the following components will revolve during the operation of this pump?

1. Cylinder block
2. Slide block
3. Both 1 and 2 above
4. Pintle

2-29. The pumping action of this pump is obtained by which of the following actions?

1. Rotating the pintle at the center of the cylinder block
2. Moving the cylinder block off center from the axis of the pintle
3. Positioning the sliding block to provide unequal travel of the pistons in the cylinder block
4. Moving the rotor and reaction ring to provide unequal piston travel radially around the cylinder block

2-30. In which of the following piston positions will the cylinder have taken on a full charge of liquid?

1. Position 1, view D
2. Position 2, view A
3. Position 3, view C
4. Position 4, view B

2-31. Pulsations of fluid flow from a radial-piston pump are much greater if the pump has an even number of pistons than if it has an odd number.

1. True
2. False

2-32. Which of the following components of a radial-piston pump is connected to the cylinder block?

1. Rotor
2. Pintle
3. Piston
4. Drive shaft

REFER TO FIGURE 4-15 IN YOUR TEXTBOOK IN ANSWERING QUESTIONS 2-33 AND 2-34,

2-33. The rocker arm will be perpendicular to the shaft when the shaft has been rotated how far?

1. One-quarter of a turn only
2. One-half of a turn
3. Three-quarters of a turn only
4. Either one-quarter or three-quarters of a turn

2-34. Starting from the position of the shaft as indicated in figure 4-15, view G, how many times will rod A be pushed out and pulled in through the wheel during each shaft revolution?

1. Once
2. Twice
3. Four times
4. Eight times

2-35. The output of the axial-piston pump is determined by which of the following factors?

1. Number of pistons
2. Length of the piston rods
3. Length of the drive shaft
4. Angle given to the tilting plane

2-36. What component of a Stratopower pump holds the pistons in constant contact with the mechanical drive mechanism?

1. Wobble plate
2. Creep plate
3. Check spring
4. Piston return spring

2-37. Automatic variation of the volume output of a variable-displacement Stratopower pump is controlled by which of the following factors?

1. Atmospheric pressure
2. Reciprocating action of the pistons
3. The position of the rocker arm on the shaft
4. The pressure in the hydraulic system

2-38. During nonflow operation of a variable-displacement Stratopower pump, what provides its lubrication?

1. Compensator spring
2. Compensator piston
3. Bypass system
4. Drive cam

Learning Objective: Indicate basic requirements for fluid power system lines and connectors, and recognize pertinent facts concerning identification, sizing, uses, and construction of pipe and tubing.

2-39. You must consider which of the following factors when selecting the types of fluid lines for a particular fluid power system?

1. The required pressure of the system
2. The type of fluid medium
3. The location of the system
4. All of the above

2-40. You must give primary consideration to all but which of the following factors in selecting the lines for a particular fluid power system?

1. The type of material
2. The material's wall thickness
3. The material's inside diameter
4. The material's outside diameter

2-41. Replacement of a piece of tubing with one having a smaller inside diameter will result in which of the following conditions?

1. Fluid heating
2. Turbulent fluid flow
3. System power loss
4. All of the above

2-42. Which, if any, of the following statements is true for pipes of the same nominal size?

1. As the pipe schedule size increases, the ID remains the same and the wall thickness and OD increase
2. As the pipe schedule size increases, the ID increases , the wall thickness decreases, and the OD remains the same
3. As the pipe schedule size increases, the ID decreases, the wall thickness increases, and the OD remains the same
4. None of the above

REFER TO TABLE 5-1 IN YOUR TEXTBOOK IN ANSWERING QUESTIONS 2-43 AND 2-44.

2-43. The nominal size of pipe whose outside diameter is 1.900 inches is

1. 1 1/2
2. 1 3/4
3. 2
4. 2 1/4

2-44. What is the schedule 40 wall thickness of pipe with a nominal pipe size of 2 inches?

1. 0.154 In.
2. 0.218 in.
3. 0.308 in.
4. 0.436 in.

2-45. What is the size of No. 4 rigid tubing , and where is the measurement taken?

1. 0.004 inch, wall thickness
2. 0.040 inch, wall thickness
3. 4/16 inch, inside diameter
4. 1/4 inch, outside diameter

2-46. Which statement about the relative bursting pressure for various sizes of tubing made of the same material is true?

1. It is different for each wall thickness regardless of size
2. It is the same for all sizes having the same wall thickness
3. It is lower for small tubing than for larger tubing of the same wall thickness
4. It is higher for small tubing than for larger tubing of the same wall thickness

2-47. Which of the following metals may be used to provide a strong, inexpensive pipe or tubing capable of withstanding high pressures and temperatures?

1. Steel
2. Copper
3. Stainless steel
4. Aluminum

2-48. Which of the following basic requirements must be considered in designing the lines and connectors of a fluid power system?

1. Inside surfaces that do not create turbulent fluid flow
2. Sizes sufficient to deliver adequate quantities of fluid to all components
3. Strength to withstand pressure surges that exceed the system' s working pressure
4. All of the above

2-49. Bends in piping serve to absorb vibration and to compensate for thermal expansion and contraction.

1. True
2. False

2-50. The determining factor for the radius of the bend to be made in a pipe is the pipe's

1. length
2. wall thickness
3. inside diameter
4. outside diameter

2-51. Coarse-toothed hacksaw blades are preferred for cutting tubing because they cut faster and are less liable to choke up with the chips.

1. True
2. False

2-52. Which of the following procedures should you follow when cutting a tube with a tube cutter?

1. Apply continual light pressure to the cutting wheel
2. Remove all burrs on the inside and outside of the tube
3. Remove all foreign particles from the tube
4. All of the above

2-53. Which of the following statements is NOT correct for cutting tubing with a hacksaw?

1. A fine-tooth hacksaw of 48 teeth per inch could be used
2. When you clamp the tubing in a vice, tighten the vice until the tubing is just starting to hold without collapsing
3. All hacksaw marks must be removed by filing

2-54. What parts of the hand tube bender are used to obtain the correct bend radius and the desired bend angle on tubing?

1. The clip and the slide bar
2. The radius block and the slide bar
3. The radius block and the clip
4. The forming bar and the slide bar

2-55. Which of the following statements is NOT true concerning the flaring of a tube?

1. The flare must be large enough to seat properly against the fitting
2. The correct diameter of the flare is obtained by ensuring that the tube is flush with the top face of the die block
3. The flare must be small enough to allow the threads of the flare nut to slide over it

Learning Objective: Recognize characteristics, uses, construction features, and installation procedures of flexible hose.

2-56. Flexible hose should be used in locations where it will be subjected to

1. intense heat
2. severe vibration
3. excessive abrasion
4. an oily environment

2-57. Which of the following information is found along the layline of synthetic rubber hoses having a rubber cover?

1. Hose size
2. Cure date
3. Federal supply code
4. All of the above

2-58. The size of flexible hose is designated In what increments measured at what place?

1. Thousandths of an inch," outside diameter,
2. Thousandths of an inch, inside diameter
3. Sixteenths-inch, outside, diameter
4. Sixteenths-inch, Inside diameter

2-59. The flexible hose that is inert to all fluids presently used and that does not absorb water is composed of what material?

1. PTFE
2. Natural rubber
3. Synthetic rubber
4. Rubber impregnated cotton or nylon

2-60. You have completed fabrication of a flexible hose assembly. Which, if any, of the following steps must you NOT perform?

1. Proof test the assembly
2. Ensure that the hose is compatible with system fluid
3. Flush and dry the hose and cap its ends
4. None of the above

2-61. Mark each of the following statements about the correct installation and use of flexible hose as true or false, then select the alternative below that lists the true statements.

A. Sharp bends may reduce the bursting pressure of the hose
B. Supports are never required when the hose is used.
C. The hose should be stretched tightly between connecetions.
D. The hose should be wrapped where necessary for protection against chafing.

1. A and D
2. A and C
3. B and D
4. B and C

2-62. A characteristic of flexible hose is that under pressure it will

1. expand in both diameter and length
2. retain its manufactured dimensions
3. expand in diameter and contract in length
4. contract in diameter and expand in length